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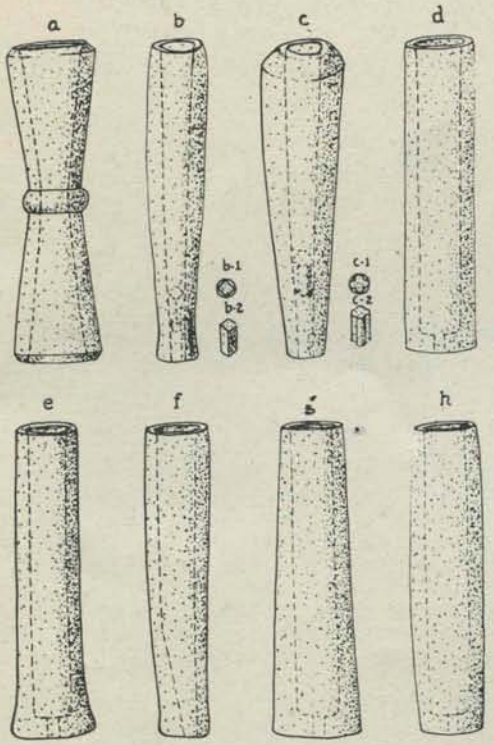
THE PROBLEMATICAL THIN SHELL STONE TUBES

William J. Howes

Of all the Indian material that has been recorded, few objects have received as varied an interpretation of use as the thin shell stone tubes of different size and form, called pipes, musical instruments, whistles, cupping tubes, etc. The difference in the form is so great that several types may be distinguished; the hourglass type which is not common in New England; the pipe which is of continent wide range; and the straight bore tube, which is generally found in pairs of different length.



DIFFERENT TYPES OF THIN SHELL STONE TUBES.

Fig.1

The hour glass type often has a raised half-round band encircling the constriction in the tube. The bore contracts in diameter as the center is approached from either end. (Fig.1, a.)

The tubular pipes have a tapering exterior with the bore contracting toward the mouthpiece. Associated with some tubes of this type there have been found plugs of stone or clay with a cross section resembling a square or four leaf clover. These plugs fit into the smaller end of the bore in such a way as to permit air to pass by them. This type of tube was probably used for smoking, as pipes of this type of stone or clay are known from different sections of the country. (Fig. 1, b, c.)

The straight bore type, or the so called shaman's tubes, which were generally found in pairs of unequal length, are the primary concern of this article. From all available sources, including illustrations of tubes described by others, tubes found in collections in different sections of the territory, and the writers own knowledge acquired while participating in the recovery of artifacts from graves, it has been determined that a large majority of these artifacts were taken from graves in which the interment was made at quite a remote period. In most graves the body had entirely disintegrated, leaving the artifacts as the only tangible evidence of the burial. Unfortunately, but little data have been preserved regarding associated artifacts which might have produced considerable information as to the person's social position and the use of the tubes themselves. The writer is offering another suggestion as to the use of these tubes, based on such data as have been gleaned. This theory, strongly impressed on him as a result of the evidence at hand, is offered in the hope that it may have points of merit in determining how and for what purpose this type of artifact was used.

These tubes are commonly made of fine grained sandstone, however tubes of trap-rock or basalt, soapstone, or clay are found in some collections. In length, the tubes vary between fourteen and four inches. The bore maintains a diameter of three-quarters of an inch from the mouth to near the base, which is closed, save for a small hole drilled through from the exterior. (Fig. 1, d, e, g, and h.) In others of the same type, the larger hole extends through the entire tube. (Fig. 6, #2141 in the Amherst College collection, and Fig. 2, 1, 2, and 3, from the Peabody Museum of Harvard.)

The outlines of these tubes fall into several types; in the larger number the tube is a straight sided cylinder (Fig.1, d), sometimes with flaring base (Fig.1,e); some taper evenly from the base to the mouth (Fig.1, g); in some, the sides of the cylinder curve outward slightly, with the base oval, rather than circular (Fig.1, h).

Both the Amherst and Peabody Museum collections include tubes of this type in which the straight bore extends at full diameter clear through the tube.

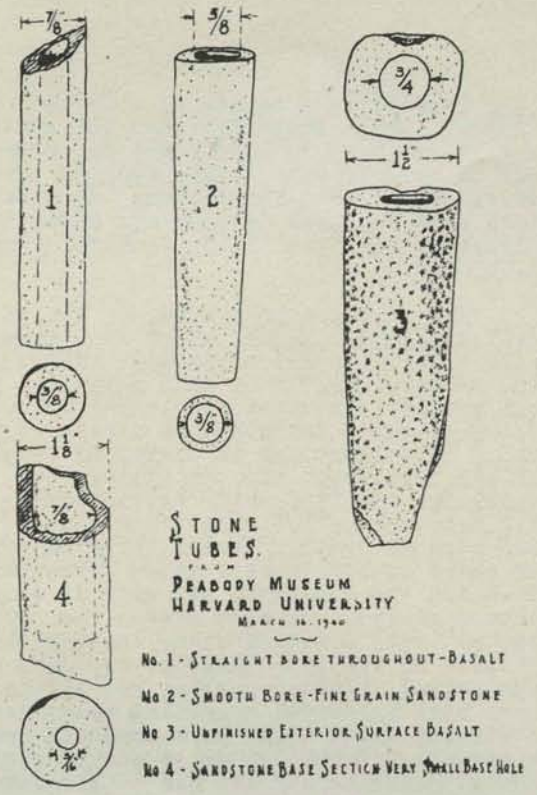


Fig.2

Drilling of these tubes was probably accomplished with a flat-based wooded drill, using sand and water as a cutting medium. In the straight cylinder type, the side walls of all tubes averages one-eighth of an inch in thickness throughout the length. Some of these tubes are illustrated with a conical bore, the diameter of which decreases from the mouth to the base. The form or outline of the material of which the tube was made was the governing factor in its drilling. The larger tube in the Holyoke Library Museum collection fully illustrates this variation (Fig.1, f, and Fig.5) for probing disclosed that the bore was of the same diameter for two-thirds of its length, then tapering to an off-center hole in the base, seven-sixteenths of an inch in diameter. The inner walls of this tube present a uniform series of fine parallel longitudinal grooves, with no evidence of haphazard scratches that would probably be seen if these grooves were the result of the process of manufacture.

Some of these tubes are beautifully polished, both inside and out, giving no evidence as to the process by which they were made, or the method in which they were used. On the interior walls of some there appear a series of concentric or successive rings which, if we have judged correctly, were made during the manufacture of the tube In others, deep gouges were made at intervals down the side, suggesting that the drill had become off-center and that its position had been corrected. This is clearly seen in a specimen from the Amherst College collection illustrated in Fig.5, #2141, and in a similar one in the Norris Bull Collection at West Hartford, Connecticut. (Fig.3) The vertical parallel lines overlaying said depressions must have been made by use after the tubes had been made.

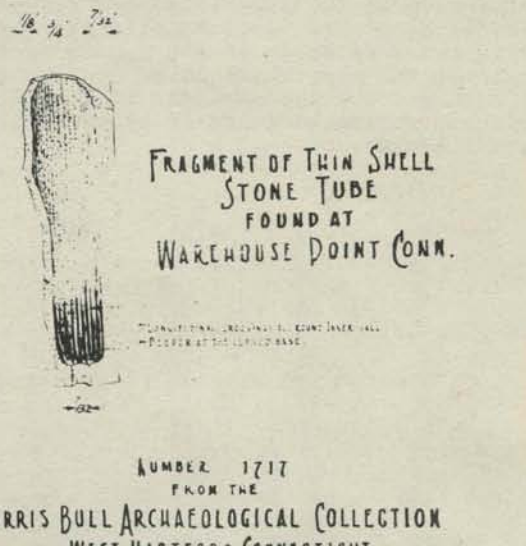


Fig.3

A fragment of another tube from the Bull Collection illustrated in Fig.6 clearly shows that something was repeatedly thrust along these parallel lines, scoring them to a uniform depth along the barrel, but that in the curved basal part of the bore, repeated use of some implement or plunger had gouged deeper grooves into the walls. This is shown in the illustration.

Such striation lines are recognized in the bore of a large bead or tube two or more inches long found at Wellfleet, Massachusetts. Also the same condition applies to other bored artifacts which have been inspected in which the striation lines overlay the concentric or successive circular scored lines and the smoothing down finish of the interior surface. The depth of scoring of these parallel vertical lines - not haphazard ones - and their freshness compared with the others would seem to substantiate the idea that they were made by use after the object was completed and that they were not the result of the manufacturing process, for they were not obliterated by the finish smoothing as were the concentric lines.

While the writer is inclined to agree with most published accounts in attributing these tubes to the paraphernalia of a shaman or medicine man, he feels that they were a more essential item in his equipment than previously suggested. With few exceptions, all descriptions note them as having been found in graves, and presumalby by inexperienced amateurs who did not realize the value of recording the association with other artifacts which might present more and valued information. At present, to the knowledge of the writer, the only known records of the entire contents of graves including a pair of these tubes are for two graves located within a mile of each other on opposite sides of the Connecticut River, one at South Hadley Falls and the other at Holyoke.

A news item containing a description of a find made by some boys playing in a sand pit where road material had been removed brought an immediate inspection of their discovery, with a recording of all the items they had found near the surface. It was felt that this was but a portion of a burial, and the next day a careful excavation of the whole grave was made for the information it might reveal.

Excavation was started at the edge of the embankment of fine sand, the face of which was sliced down vertically, shaving off a very small amount at a time. It was found that the cut had been made lengthwise of the body in the grave, and that there lay, clearly defined, the whole outline of the original excavation, the body, and all the wrappings surrounding it.

The body had been placed about five feet below the original surface of the ground. The location, which was exposed and subject to erosion by westerly winds, had been lowered almost a foot below the surrounding land surface. In the light tan quartz sand the grave shaft was clearly marked by darker sand in which surface material had been mixed. A band of reddish brown color around the body probably was all that remained to mark the wrappings which surrounded the body which had been buried in a semi-reclining position, facing the east. No bones were intact save for a large portion of the skull, with several fragments, including the lower jaw. The rest had disintegrated to a mass as black as charcoal which pulverised to fine particles and lumps, when dry. From the condition of the teeth in the lower jaw it is estimated that the person had been in the prime of life, approximately between twenty and thirty years of age. Although the teeth and bones were stained green by salts from the copper beads, the teeth which later dropped from the jaw after exposure to the air crumbled to dust. Microscopic examination of the reddish brown sand resulted in the discovery that it was filled with a gummy substance, strengthening the belief that this represented the body wrapping.

Fragments of hearth stones, burnt shale and flint were mixed in the fill. Two or three round fire stones had slumped into the pit near the body. These might indicate that the deceased had been buried under the floor of his house for religious and sentimental reasons, that he had been buried at a time when the ground outside was frozen and the only easy digging was in the house, or that the burial ground had previously been used as the site for a house.

Copper beads lay around the head and chest, representing at least three strings of considerable length. There were enough of these to fill a pint can. Three sizes were found; they varied between three thirty-seconds of an inch and three eighths of an inch in diameter. Corrosion of the copper had stuck many of them together in groups of three, four, or five. In one place where they had parted, loose twisted fibre, upon which they had been strung, is still to be seen. Without exception, these beads were all made from copper that had been hammered into sheets, sheared to the right width, and rolled to the required size and shape. (Fig.4.)

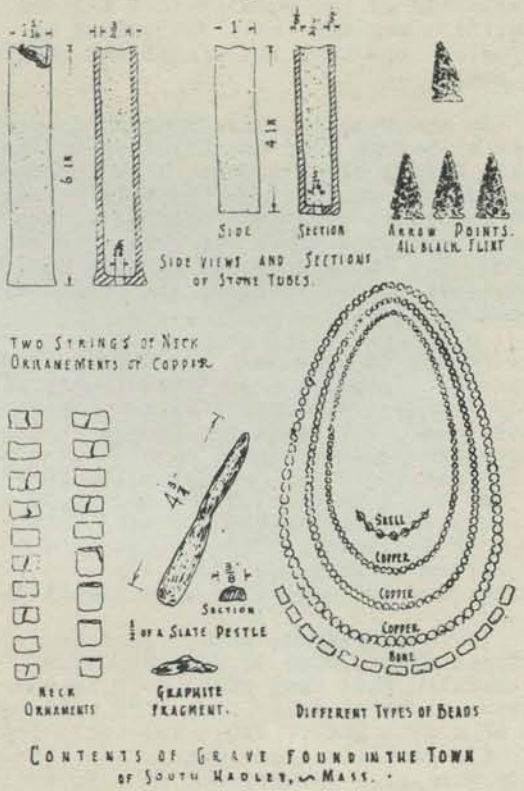


Fig.4

In addition to the copper beads, two sets of ten copper ornaments of graduated sizes, which might be called clasps, were found lying at either side of the chest, with the smallest at the bottom, and running

upward and inward toward the neck. They were of flattened elongate type, from three eighths to five eighths of an inch in diameter, made of strips of metal from three eighths to one-half an inch wide. They had the appearance of having been clasped around some object, as one end was folded over the other, leaving a rectangular opening about an eighth of an inch across in the lower one, and grading up to three-sixteenths of an inch or more at the top. One set was of uniform elongate type, while the lower six of the other set were of the same type; the balance of this set consisted of round rolled rings. It is assumed that these clasps were used as a type of necklace hung around the neck with the ornaments dropping down over the chest on either side.

Professor K.W. Meissner, of Worcester Polytechnical Institute, has determined by spectroscopic analysis of one of these ornaments that it was not made from European copper. On the other hand the copper does not conform to an analysis of Lake Superior copper. On fourteen spectrographic picture lines were present to indicate the presence of copper, calcium, aluminum, magnesium, natrium and barium, Professor Meissner is of the opinion that all the impurities may have been introduced by diffusion, and that all except the calcium are weak.

An analysis of Lake Superior copper given in Volume X of the Bulletin of the Public Museum of Milwaukee, I am informed, shows silver and iron as the only impurities in copper from that district. The copper from this grave was from some other source, but until a coppér showing similar impurities can be located, its origin will remain unknown.

Twenty or more bone beads were found in a very fragmentary condition, many of which crumbled upon handling and exposure to the air. Six small marginella shells which were found measured about a quarter of an inch in length. Three arrow points and one knife blade of black flint, of a form quite common around Holyoke, were also found in the grave. (Fig.4) Included in the artifacts were two stone tubes, a slate pestle, and a fragment of pure graphite.

The stone tubes, made from a very fine textured stone, were of such beautiful workmanship that they might well be considered works of art. They were polished, and of a rich gray-brown color reminding one of a partly colored meerschaum pipe. While they were symmetrical in form and a little over an inch in diameter, one measured four inches, the other six inches in length; the larger one has a slightly flared base. Otherwise they are identical. The three-quarter inch bore extends through almost the entire length, with a five-sixteenths inch hole through the base, drilled from the opposite end to meet the bore. As the tubes are not now accessible to the writer it is impossible to say whether there are any marks on the inside walls which would give any indication of the type of implement used in drilling them, or whether there is any incrustation that might show the purpose for which they were used. The rim of the large opening of each tube is worn down unevenly, as though they had seen considerable service.

The slate object that has been called a pestle was four and three-quarters inches long; it appeared to be only one half of the original. The graphite was of a very pure quality that easily soiled the hands and left a greasy feeling upon being rubbed. It had no appearance of having been used in any way. The late Professor B.K. Emerson of Amherst College was positive, after examining the specimen, that it came from Sturbridge, Mass.

The contents of this grave bears a great similarity to that of one subsequently found on the opposite side of the river in Holyoke, on a sightly place on the brow of a hill overlooking the Connecticut and its valley and the country to the east. Some workmen digging for sand to scatter on the icy sidewalks uncovered some implements that excited their curiosity. All that they found at the bank or scattered along the walks was presented to the Holyoke Public Library Museum. This find was made at a depth of about five feet below the surface, but it is not certain whether all the objects were recovered as all evidence of a grave had been obliterated. A careful inspection of the excavation and the sidewalks revealed no other artifacts or bones, save for two or three small fragments. The objects recovered from this grave consisted of copper and bone beads, two stone tubes, a few marginella shells, a small fragment of the lower jaw and small fragments of the skull. (Fig.5.)

The points of similarity between these two graves is quite outstanding. Both grave were located on a sightly point of a hill with water running just below. Differences in the artifacts were more differences of detail than of artifacts themselves. The copper beads, while larger, were fewer in number and perhaps of a cruder workmanship, but were made by the same methods, and probably from the same quality of metal. The stone tubes were evidently made for the same purpose as those found in the grave in South Hadley Falls. While the workmanship on these tubes was not as fine, it indicated more clearly the purpose for which they were used. They are not as symmetrical in form, nor are they made from the same material. One point of comparison that should not be omitted is the length of the tubes. Those from the Holyoke grave are proportionately longer than those from South Hadley Falls. The bones likewise are from the head and were of the same greenish color throughout; they evidently owe their preservation to the

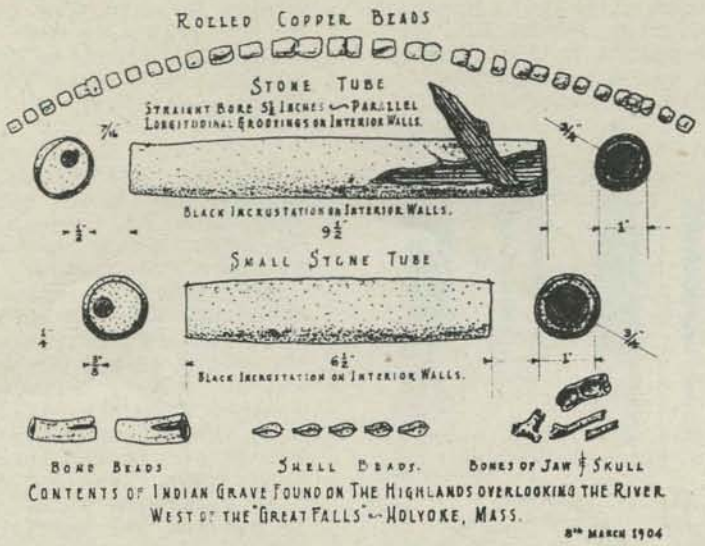


Fig.5

same agency. Like pieces of the lower jaw were found in each grave; that from the latter was greatly contracted with shallow, toothless sockets to show that the grave had been that of an aged person.

The copper beads, of varying sizes ranging from one-quarter to one-half inch in diameter, were sufficiently numerous to make a single string necklace eighteen inches long. Corrosion had cemented the beads together in two's and three's. Examination of the beads showed that they had been loosely rolled, probably due to the uneven thickness of the metal produced by crude hammering methods from a lump of native copper. The granular structure of the metal was clearly in evidence.

The stone tubes, which were not symmetrical in form, were approximately one inch in diameter, one six, the other, nine inches long. The smaller end of the nine inch tube is oval in cross section with one diameter almost double the other. Both tubes were made from a fine grained sandstone resembling the Portland brownstone, finished smooth on the outside. In both, the diameter of the bore was three-quarters of an inch, while that of the smaller hole at the base was three-eights.

On the interior surface of the larger tube there was an incrustation of a black substance which might have been powdered charcoal or ground graphite. When rubbed between thumb and fingers, this substance had a smooth and slippery feeling. In the smaller tube there were also remains of a black substance. In an effort to identify the incrustation a microscopic slide was made from each tube while a third slide was made from powdered scrapings from a lump of graphite. Under high powered microscopes the slide made from the scrapings from the larger tube seemed identical with that made from graphite, save that one particle seemed to have a cellular structure such as might be expected in charcoal. It is possible that the incrustation on the smaller tube may have been charcoal. The slides were not scientifically prepared, and while the texture of the powder was probably coarser than it should have been, the results, inconclusive as they are, are the best obtainable at this writing.

An article originally published in the Springfield Republican of 1868 or 1869 which was later reprinted in other publications of note, including the Historical Magazine for January 1869, tells of the discovery of a burial place near the "Great Falls" in Holyoke, Mass. where some ancient graves were found. The find was made while excavators were levelling off a portion of a hill in the eastern portion of the city, not far from the river. Willoughby has quoted this at length in his Antiquities of the New England Indians, page 83. These graves, to the number of twenty, were characterized by a covering or paste of red clay or ochre which clearly defined the position of the body. Included with the burials were flint arrow points, copper spear points, copper beads made in the form of triangular prisms, a large dish hollowed out of soapstone with handles at either side, pipes of the same stone "skillfully and curiously wrought", tomahawks of flint, vermillion war paint, and generous strings of wampum. (Fig. 6)

The account concludes with the following statement, not quoted by Willoughby:

"The habit of the aborigines is to bury with their dead all their personal effects in order that they may have them in the spirit

land, and thus it happens that these various articles are found with their bones. The pipes dug up had been buried full of tobacco ready to be puffed by their owner's ghostly lips in the celestial hunting ground."

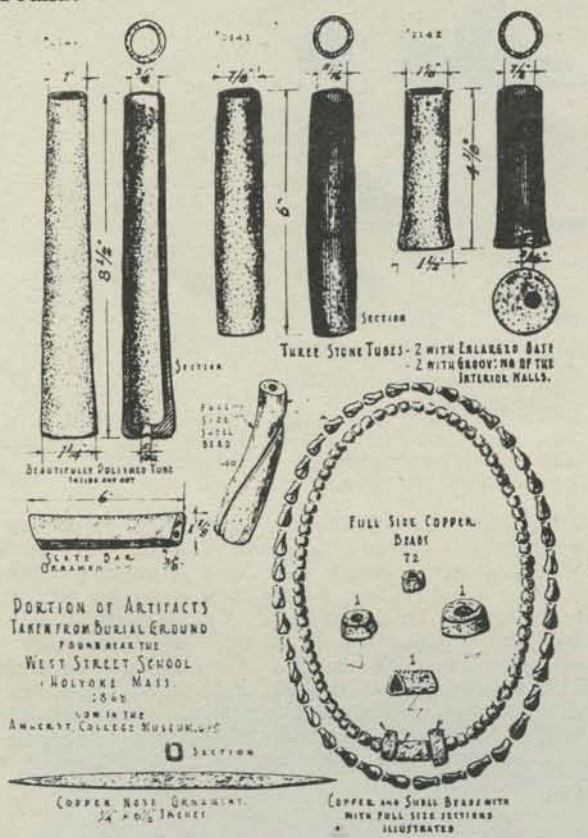


Fig.6

A thin shell stone tube, a short chunky celt or axe, and a fragment of hematite now in the museum of Mt. Holyoke College have just been brought forward. These were found many years ago in the development of the old "Brown Tract", a portion of the Elmwood district of the city of Holyoke, located on a high bluff in the southerly portion of the city with an extended view to the east with the Connecticut River a short distance away in the foreground.

The tube found here is eight and one half inches long and one and one-quarter inches in diameter. The bore, which is three-quarters of an inch in diameter, is maintained at that size for five and one half inches from the mouth of the tube. From this point it contracts gradually to a hole three-eighths of an inch in diameter through the end of the tube. There is no evidence to indicate the method of construction or use, for the inside of the bore bears a polish equal to that on the outside of the tube.

This makes the fourth location from which graves of this type have been recorded within a radius of a mile from each other and from the fishing falls that attracted the Indians to Holyoke at the season of the running of the fish.

Through the courtesy of Dr. N.C. Nelson the writer was permitted to inspect several similar thin shell stone tubes in the collection of the American Museum of Natural History. Among them was one from East Windsor, Connecticut, which had a reddish pink pigment incrusted on its inner walls. This tube was a cylinder about eight inches long, with faint longitudinal lines about one-third of the distance down its inner walls. A very large portion of one side of another from Plainville, Conn., is broken away, revealing the parallel longitudinal striations on the inner walls. This was a short tube three and one-half inches long with excurvate sides. The largest diameter, is one and one quarter inches at the center, whence it diminishes to seven-eighths of an inch at either end. As has been noted, the sides curve outward, and do not taper in a straight line. Diameter of the bore, which was five-eighths of an inch for two-thirds of its length gradually contracts to three eighths of an inch at the end.

Other tubes in the collection from states to as far south as Virginia had no outstanding features worthy of note.

In texture and color, the material from which the tubes were made resembles very closely that of many found in New England. It was definitely determined that those in the American Museum were made from indurated clay. Professor B.K. Emerson, in his Smithsonian publication on the Geology of Old Hampshire County (Vol. XXIX, 1898, p.459) under "Origin of Clay and Marl Deposits", refers to indurated clay within this section Fragments of this laminated marl or clay that was transformed into indurated clay have been found on several camp sites.

In his Archaeological History of New York, on page 454, Dr. Arthur C. Parker says

"Like all other polished stone 'problematicals' we may only conjecture what tubes were used for. It has been suggested that they were used for smoking pipes, drinking tubes, sucking tubes for drawing blood from incisions, shamans' paraphernalia, whistles, medicine cases, and for several other purposes. On the Pacific coast, cigar shaped stone tubes were used for smoking pipes; tubes of bone and horn were used in historic times for sucking blood, or in shamanistic practices. These stone tubes have been found in graves filled with red or black pigment, and others have had internal clay plugs so placed that by blowing at one end a loud whistle was emitted. Tubes may have had various uses according to type. When we try to guess the uses of the Indians

creations and to fix one specified purpose upon one of them, we must remember the hair pin of today and then challenge the archaeologists of the eons to come to determine even a dozen of its manifold purposes and we may likewise prepare our ghosts to rise and confound him if he dares say that only one use, as that of removing coins from a crack, or that of picking a lock was the sole and only one."

The late Professor George H. Perkins of the University of Vermont informed the writer many years ago that different colored pigments had been found in these thin shell tubes within the territory with which he was familiar. He also spoke of stone plugs that fitted into the small hole at the base of the tube. (Fig.1,b.) These stone tubes evidently had a plug for corking up the small hole at the end, and there is little doubt that all of them were supplied with either stone or wooden plugs. At Pecos, New Mexico there were discovered "certain tubular pipes in which there is a rectangular plug, or one with a clover-leaf cross section, inserted into the tube and large enough so that it will stop somewhat short of the opening at the breech or rear end of the tube. (Fig.1,c.) If the tube is loaded with tobacco from the muzzle, these little plugs serve very nicely to keep the tobacco from being sucked into the mouth."

While this would be so if they were all smoking pipes, a review of the several types found in different collections shows that a fair percentage of them have an enlarged base or mouthpiece. It does not seem logical that a people so familiar with smoking should make the end with the mouthpiece larger than the end with the opening, and furthermore, a pipe bowl filled with tobacco to a depth of from four to twelve inches would hardly seem practical from a smoker's point of view. It again seems clear that a group classification should be made to determine the use of each type independent of that of the others.

When a shaman was called on to minister to a patient whose illness was beyond the ability of the squaw with her poultices and brews, he retired to his lodge to deck himself out in all his regalia, and to daub his person with divers colors, before proceeding to the bedside of his patient. Either the pigments had to be prepared at the time of the call, which would delay his appearance, or they were ground and mixed with oil or grease beforehand and stored away in a container ready for use. If this latter were the practice, then the stone tubes would make ideal containers. A stone or wood plug in the small hole would hold the color until needed, while a plunger in the large hole would force out the required amount of paint without delaying the shaman in applying the paint to face and body.

A review of the data present reveals that in the South Hadley Falls grave (Fig. 4) there was a pair of these tubes, a pestle, and a lump of graphite. The grave of the aged person in Holyoke (Fig.5) contained a pair of tubes on the interior walls of which there was an incrustation which had a slippery feeling when rubbed between the thumb and fingers, similar to the feeling of graphite. Examination of scrapings from these tubes showed that the contents of the larger tube looked like scraped graphite under a microscope, while the contents of the smaller tube included some particles which appeared to have the cellular vegetal structure suggesting that they might have been ground from charcoal. The description of the contents of these tubes by Parker and Perkins, the "vermillion war paint" in the 1868 Holyoke graves, and the report of Plough that the 1868 Holyoke tubes and the Turner's Falls tubes in the Amherst College collection contained a brownish or red incrustation all suggest that the smaller tubes might have contained the colored pigments, while the larger ones contained the black.

While a letter from Douglas S. Byers, Director of the Museum of the Robert S. Peabody Foundation for Archaeology at Phillips Academy refers to several tubes of this type as having a carbon deposit on the interior walls, it is true that no definite data has been published giving an analysis of any such incrustation on tubes of this type. Such incrustation, if it existed, was doubtless removed by the collector at the time of finding, as so much dirt.

This theory was suggested many years ago but the writer was discouraged when told that "some amateurs had suggested the same thought, but that there was no historical reference" and that the explanation was purely conjectural. With the accumulated data the conviction still remains that there is some basis for the theory here presented.

Holyoke, Massachusetts
October, 1940.

ANALYSIS OF COPPER BEAD FROM INDIAN GRAVE HOLYOKE, MASSACHUSETTS

General Research Department
Revere Copper and Brass Incorporated

File No.	Problem No.	Subdivision	Report No.
1A-0-100	S	6/3/41	A-2049

OBJECT OF EXPERIMENT OR TEST:
ANALYSIS OF COPPER BEAD FROM INDIAN GRAVE, HOLYOKE, MASSACHUSETTS

CONCLUSIONS:

Qualitative spectrographic analysis of the copper bead submitted showed the presence of:

Calcium	Silver
Magnesium	Silicon
Aluminum	

The physical characteristics of the copper in the bead indicate that the impurities present, with the probable exception of silver exist as contaminants within the numerous small voids and cracks in the metal and are not directly combined with the copper.

The copper used in forming the bead is believed to have originated in the Lake Superior district because of its freedom from arsenic, antimony, nickel, bismuth, and lead.

Signed: L.H. Decker (copy)

Approved: W. Lynes (copy)

RESEARCH DIVISION

INTRODUCTION

A copper bead, said to have been discovered in an isolated Indian grave at Holyoke, Massachusetts, was received from Mr. William J. Howes, Holyoke, Massachusetts, through Mr. A.C. Steele at the New Bedford Division. An analysis was requested in an effort to establish the original source of the copper used in forming the bead.

EXAMINATION

A few small pieces of copper were cut from the bead and thoroughly cleaned by treatment with C.P. hydrochloric acid and nitric acid, washed clean with distilled water, and dried. A D.C. arc spectrogram was prepared using some of these pieces while others were reserved for microscopic examination.

The spectrogram indicated the presence of aluminum, silver, calcium, magnesium, and silicon. The absence of nickel, arsenic, antimony, bismuth, lead, iron, and tin was noted.

Microscopic examination of a mounted and polished section prepared from one of the pieces showed the copper to be practically free from combined oxygen but numerous voids and crevices which appeared to contain non-metallic matter existed throughout the metal. To free the copper of the material in these cavities by chemical or mechanical cleaning was practically an impossibility.

DISCUSSION

The non-metallic matter contained in the voids and crevices within the copper of the bead is believed to consist of compounds of calcium and magnesium and the other contaminating elements (except silver) found to be present by spectrographic analysis. The presence of so little combined oxygen indicates that the bead was cold-formed directly from native copper, and it is believed that some of the non-metallic matter was worked into the copper in this operation. Other impurities are thought to have found their way into the cavities during the long period of contact with the earth and decomposed matter of the grave.

Native copper which the Indians could have obtained existed in several localities on this continent, but only in the Lake Superior district could they procure nuggets of any or every size for shaping into implements without melting down. Consequently, this was the center of their greatest industrial activity. Native copper from this source is extremely pure. It is oxygen-free ductile, and contains appreciable amounts of silver as an impurity. It will be noted that the copper of the bead conforms to these characteristics if the calcium, magnesium, aluminum, and silicon are assumed to be contaminants which have associated with the copper in the manner already described.

It therefore seems probable, in view of the composition of the specimen subittted, the extent of Indian operations in procuring copper in the Lake district, and the routes of travel existing at that time, that the copper of the bead submitted came from the Lake Superior deposits.

So far as it was possible to determine, no deposits of pure native copper from which implements and ornaments could be cold formed existed in Mexico. Most of the ore found in that locality is a basic chemical compound of copper which requires the use of smelting operations for reduction to the metallic state.

THE SOURCES OF NEW ENGLAND INDIAN HISTORY PRIOR TO 1620*

Henry F. Howe

The task which our energetic President has set before me is really that of reviewing a century of New England history in twenty minutes. Much as I wish that could be done, I want to state that this paper is not an attempt to do it. What I do hope to accomplish is to describe for you the available source materials for a study of the most obscure, yet the most significant, century in New England's Indian History, that between 1520 and 1620 before the great plague had wiped out most of the coastal tribes. If in the course of giving you a sort of running bibliography of the period I can at the same time succeed in imparting to you some of the flavor of the times I shall be more than pleased.

The only primary sources at our disposal are the narratives of a motley group of navigators whose interest in the Indians was always incidental to their motive of exploiting the new country. A few were eminent geographers bent on adding to the sum of the world's knowledge of these coasts. Most of them were making a deliberate attempt to promote New England as a desirable site for colonial effort. A few wrote their logs simply as a record of a trading voyage. There is every indication that hundreds of other vessels traded and fished along these coasts without leaving any accounts of their visits. Among them all we may be sure that there was not a single professional archaeologist or ethnologist, though I can produce evidence that there were a number of amateurs.

Giovanni da Verrazano wrote the first of the annals in New England's history. Sailing under the auspices of King François 1st of France, he coasted North America from the Carolinas to Nova Scotia in the spring of 1524. His was probably the first voyage which clearly demonstrated that the continuous coastline of a new continent stretched all the way from the Spanish possessions in Florida to the English and Portuguese discoveries around Newfoundland. For our purposes the significant event was his stay of two weeks in Narragansett Bay. Approaching by way of Block Island, he entered Newport Harbor, where he was met by about twenty dugouts full of Indians who seemed never to have seen European ships. These Indians were dressed in embroidered deerskins and wore necklaces; they knotted their hair behind their heads. The women were dressed similarly, with the hair braided. Some wore lynx skins upon the arms, and various head and ear ornaments, some of which were of copper. They were more interested in ornamental trade objects of glass than in iron tools or cloth. Their faces were painted in several colors. They were friendly and cooperative, but jealous of their women. One of the sachems put on an exhibition of archery and perhaps a running race or a game for the visitors' entertainment. The Indians killed game with snares as well as by bow and arrows, and for arrow-points they used "emery, jasper, hard marble and other sharp stones". They made dugout canoes "sufficiently commodious to contain ten or twelve persons." He saw their circular houses, "ten or twelve paces in circumference, made of logs split in halves -- covered with roofs of straw, nicely put on," He noted that they moved their houses from place to place. As many as twenty-five or thirty people lived in one house. They carried on agriculture more carefully than in other areas he visited. He was surprised at their longevity. He apparently witnessed a funeral ceremony accompanied by prolonged singing and weeping.

Farther up the coast, apparently in Maine, Verrazano found a very different race of natives who were "rude and barbarous." These Indians, by contrast, were hunters and fishermen, carried on no agriculture, and were very difficult to approach. They wanted in trade only knives and fishhooks, and when Verrazano penetrated two or three leagues inland "against their will," they showered the explorers with arrows. These also wore copper ear-rings, and they were clothed in the skins of bears, lynxes and seals.

The second New England voyage that gives us some information about Indians was incidental to the short-lived Huguenot colony of 1555 in Brazil. The celebrated cosmographer André Thevet went out to Brazil with the colonists, and wrote that he returned by way of the North American coast, stopping for five days at a great river called

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"Norumbègue," which from evidence in the text seems almost surely to have been the Penobscot. Thevet found the Penobscot Indians at that time very numerous. The Frenchmen were wary of them, but the Indians brought gifts of meat and fish and were pleased with the trinkets they received in exchange. Thevet went ashore and visited their houses, where he saw killed animals hung from the rafters. Meat and fish were roasted on a fire for the Frenchmen. While the feast was in progress "some rogues came in to bring to the king the heads of six men, which they had taken in war and massacred." Thevet reproduced what he alleges were some of the Indians' words, and gives their translations.

During the remainder of the 16th century desultory trading and fishing was kept up, particularly by the French, along the Nova Scotia and northern New England shores, but no chronicles of these voyages have come down to us. The next narrative of value to our archaeological purpose was that of Bartholomew Gosnold, in 1602. It was a freelance trading voyage sent out by English merchants, combined with a rather faint-hearted project for colonization, which never came off. Gosnold sighted land somewhere near Portland and started southward. Probably in the region of York Beach in southern Maine, he was accosted by a small French boat under oars and sail, manned by eight Indians in European clothing. They obligingly drew a map of the coast with chalk and spoke some French including mention of Newfoundland. So far had intercourse between traders and Indians proceeded at this period!

Gosnold continued on southward and eventually reached Martha's Vineyard, where he found no Indians, but did notice "an olde piece of a weare of the Indians to catch fish." There were inhabitants on some of the Elizabeth Islands, "yet wee found no townes, nor many of their houses." Fifty natives came to them from the mainland, however, in nine canoes, naked except for a breech-clout, copper beads and feathers. These natives brought them boiled fish in baskets made of twigs. They smoked tobacco in clay and copper pipes. They had many beaver, fox, otter, wildcat and deer skins. When one of them stole a shield from one of the Englishmen, the sachem made him bring it back. The natives had many chains, ear-rings, collars and arrow points of copper, all the ornaments being made of small hollow pieces, "foure hundred pieces in a collar," but there were also large pieces such as drinking cups. They claimed their copper came from holes in the ground on the mainland. They carried fire-sets in little leather bags. Some of them made artificial beards of fur, and one Indian wanted to trade his with a red-beared sailor! They showed great facility in pronouncing English words. Brereton, who wrote the Gosnold narrative, found them thievish but intelligent and pleasant. Minor hostilities developed toward the end of Gosnold's three weeks' stay at Cuttyhunk, and the planters lost heart and sailed home.

Our fourth narrative concerns the voyage of Martin Pring, another English trading voyage sent out as a direct result of the successful Gosnold expedition of the year before. Pring put into the harbor of Plymouth, Massachusetts in June, 1603 and stayed there for seven weeks, gathering sassafras. He found about two hundred Indians living about Plymouth. He says they ate mostly fish. To the accompaniment of a guitar played by one of the sailors the Indians sang and danced in a circle, and they presented the musician with tobacco, pipes and snake-skin girdles as tokens of appreciation. They used witch-hazel bows five or six feet long, painted black and yellow, the strings made of three twists of sinew. The arrows were over a yard long, of a fine light wood with three long black feathers well bound on. The tapering quivers were made of long dried rushes decorated with diamond-shaped colored designs. The men were taller than the Englishmen and carried a bag of tobacco on their girdles. The women wore aprons extending to the knees in front and a bear skin over one shoulder. There were birch-bark canoes at Plymouth, seventeen feet long and four feet wide. In the Indian gardens he saw tobacco, pumpkins, cucumbers, and corn. The savages were very much afraid of two mastiff dogs which the English had brought with them.

Toward the end of Pring's stay the Indians began to appear threatening, and, on the day before the English left they set fire to the woods where the crew had been working.

Our next three New England voyages were all recorded for us by Samuel de Champlain, royal geographer for the French fur trading and colonial expeditions of De Monts and Poutrincourt between 1604 and 1606. It is impossible to do justice to Champlain's excellent narratives in the framework of this paper, and I therefore advise any of you who are not familiar with them to read them.

Champlain's voyage of 1604 was limited to the Penobscot River area. He traveled about 60 miles up the river and made an alliance with the followers of the local sachem, Bessabez. He found no villages but saw a few bark-covered houses. He saw only 60 Indians called Etechemins, and said that they had no fixed habitation. Gifts were exchanged, there was a feast of venison, and Champlain learned that by portage routes these Indians sometimes traveled as far as the St. Lawrence.

In 1605 Champlain thoroughly explored the coast, from the mouth of the Kennebec in Maine to Eastham on Cape Cod. The Kennebec Indians planted no corn except far up the

river because of wars with other Indians, who had for years made raids on their harvests. Again he found the Indians few in number, good hunters, particularly on snowshoes in winter, but they lived on shell fish if the hunting failed. The women made all the clothes and dressed the game.

At the mouth of the Saco River south of Portland, Champlain found an entirely different tribe of Indians. Their language was different, they had no furs to trade, they shaved their heads except for a scalp lock, and they lived mostly by agriculture. They had a large bark-covered cabin surrounded by a log palisade. They used wooden shovels and hoes of the shells of horseshoe crabs to cultivate their corn, beans, pumpkins, squashes, and tobacco. They pointed their arrows with the tail of the horseshoe crab. They were friendly and cooperative.

At Gloucester, the natives made a map of Massachusetts Bay for Champlain, and marked on it six chiefs and the tribes who lived in that area. The Indians were much more numerous, were agricultural, and had birch canoes.

Around Boston Harbor, Champlain saw a great deal of land cleared and planted. He gives an excellent description of the making of a dugout canoe there. The Indians at Boston already had a few iron hatchets, but were still using stone axes also. He wrote that the stones used to scrape out the dugouts were like musket flints.

Along the South Shore at Plymouth, Champlain was met by large numbers of dugouts, some holding fifteen or sixteen people. He saw a great many round houses scattered among extensive corn fields. At Plymouth one of the Indians who had been fishing for cod from a canoe gave him a fishhook, in which the bone barb was bound on with hemp from a native plant, and the fish line was made from the bark of a tree. The Indians used columns of smoke for signals.

At Eastham, on Cape Cod, he found again many houses in garden-plots. Some fields were intentionally left fallow, the weeds then burned, and the land worked over with wooden spades. The houses were thatched with reeds. These natives had nothing to barter and were thievish, one Frenchman being killed in the melée that followed an Indian's theft of a copper kettle.

On the return voyage the sachem of the region around Portland gave Champlain a young Etechemin boy, a captive in war, indicating that hostilities were going on at the time between the Indians of Casco Bay and those on the Penobscot.

Champlain's 1606 voyage was chiefly notable for events at Gloucester and Chatham. At Gloucester, in late September, there were several hundred Indians. He observed the Indians' treatment of a wounded foot by singing, motions of the feet and hands, and breathing on the wound. The harvest was complete, and visiting sachems, one from the Saco village were present. He learned how clearings were made by cutting down trees, burning the branches on the stumps, and planting corn between the stumps. The Gloucester Indians were growing hostile when the Frenchmen departed.

At Chatham, the Indians stored corn for the winter in grass sacks buried in trenches in the sand. About five hundred Indians lived there, and were good farmers and fishermen, but poor hunters. Some of the houses were thatched with corn husks. After the Frenchmen had stayed there ten days, the natives began to move their houses and their women and children inland. This was the prelude to an early morning attack on the visitors in which four Frenchmen were killed. Later, the Indians returned and disinterred the bodies of those killed and attempted to burn them. The French ultimately exacted vengeance on the natives by ambushing six Indians and coolly slaughtering them. The French then returned to Nova Scotia never to return again.

The next voyage which we should mention actually preceded Champlain's second expedition, but for the sake of convenience I have deferred discussing it. Captain George Waymouth conducted a brief English exploration of the region about Monhegan Island and the neighboring St. George's River near Thomaston Maine, in the spring of 1605. It was a fur-trading voyage but was planned as a reconnaissance for a projected colony in that region. James Rosier's narrative adds little to our previous knowledge of the Maine Indians. Witch-hazel bows, bone pointed arrows fanged like a harping-iron, and darts with bone points were seen. The descriptions of clothing, birch canoes and large clay pipes are in accord with previous observations. These Indians had dogs. They seem never to have seen fish caught with a net. They sometimes used the claw of a lobster as a tobacco pipe, and had square boxes of bark in which they brought berries to the English. They performed a circle dance about a fire, beating the earth with fire sticks and stones as they stamped on the ground. Nearly three hundred Indians assembled and became threatening to the English when their furs available for trading were disposed of. The most significant result of the voyage was the kidnapping by the English of five Pemaquid Indians who were taken to England to be trained as pilots of later voyages to the coast of Maine.

George Waymouth's voyage was one of the preliminaries to the Plymouth Company's attempt to found a settlement at the mouth of the Kennebec River in 1607. Further effective exploration was done in the area by Martin Pring in 1606 with the help of Nahanada, one of Waymouth's captives, who was thus

returned to his Pemaquid home. At length in 1607, under George Popham and Raleigh Gilbert, an expedition of one hundred and twenty settlers piloted by Skidwarres, another one of Waymouth's captives, arrived off Pemaquid, and a happy reunion of Nahanada and Skidwarres ensued. The settlers sailed on to the mouth of the Kennebec where at Popham Beach they made the first English attempt at a plantation in New England. Skidwarres refused to stay with them and this loss of their only Indian interpreter was doubtless a blow to the fortunes of the colony, although relations with the Indians remained reasonably friendly. There is nothing in either of the fragmentary narratives of the Popham Colony which is of especial archaeological interest, except that there are illustrations of the rather wary contacts between settlers and Indians, as sources of friction between the two races began to arise. As we all know, the Kennebec colonists returned to England after a year, and the English threat to the Maine Indians was thus postponed for several decades.

In 1609, Henry Hudson appeared on the Maine coast on the way to his discoveries about the Hudson River. He traded with the natives and was told by them "that there were gold, silver and copper mynes hard by!" In return for this shrewd information he cut himself a mast from the Penobscot forests, and then "Manned our boats --- with twelve men and muskets, and two stone pieces or murderers, and drove the savages from their houses and tooke the spoyle of them, as they would have done of us." Later, at Cape Cod, his chronicler Robert Juet makes note of the fact that the people have "pipes, the boles thereof are made of earth and the pipes of red copper."

In 1611 Captain Edward Harlow, exploring among the islands south of Cape Cod, captured some Indians, but one named Pechmo got away, and with his friends "cut their boat from their sterne, got her on the shore and so filled her with sand and guarded her with Bows and Arrows the English lost her." At another island "the Salvadges in their canoes assulted the ship till the English Guns made them retire." Harlow returned to England with five Indian captives.

There is not space in this paper to do more than record the fact that the French Jesuit priest Pierre Biard began to prepare the ground in 1611 for a Jesuit mission to the Indians on the Penobscot. His report in 1612 of his explorations in central Maine is more revealing of the shrewd missionary zeal of the priest than of the character of the Indian. Likewise the grotesque breakdown of the eventual Jesuit colony at Mount Desert in 1613 under the guns of Sir Samuel Argall from Virginia offer us little of value about the Indians of Maine, although it affected their destiny historically.

But early in 1614, at the mouth of the Hudson River, a ship was setting sail which was of greater interest to our Indian purpose. The Dutchman Adrian Block, having lost his trading ship by fire, had built himself a little vessel called "The Restless," in which he set out to explore the shores of Connecticut and Rhode Island. About Norwalk, Connecticut he found a people who called themselves "Siwanois" and at New Haven he encountered the "Quinipeys", who took many beavers, but were rather indolent about fur trading. Block sailed sixty miles up the Connecticut River, noting that there were few Indians near its mouth, but that the "Sequins" lived about fifteen leagues above, and still higher, near the present South Windsor, the "Nawaas" had corn fields and a palisaded village. They termed the bread made of their corn "leganick". Still higher up the valley lived the "Horikans," who used birch canoes. At East Lyme, east of the Connecticut's mouth, Block found the "Morhicans," and up the Thames River were the "Pequatoes," then at war with the "Wapanoos". In Narragansett Bay he found the "Nahicans," on the west side, and the "Wapenocks," in the lower part of the bay. Nathattou and Cachaquant were two of the sachems of the "Nahicans," or Narragansetts. Thus while Block's descriptive information was meager, he did establish for us some familiar tribal names at that early date, in an area for the most part untouched by earlier voyages.

Also in 1614, came another explorer with a gift for recording Indian names. Captain John Smith has suffered at the hands of historians because of some tendency to exaggeration of the Pocahontas episode. But his observations of New England during his brief voyage were brilliant and trustworthy in the extreme. He was the first to record for us such names as Monhegan, (Monohiggon), Musconcus, (Nusconcus), Casco (Aucocisco), Agamenticus (Accominticus), Piscataqua, (Passataquack), Aggawam, Naumkeag, (Naemkeck), Massachusetts, Ponkapoag, (Pocopawmet), Cohasset (Quonahassit), Pamet (Pawmet) and Nauset (Nawset). He amplified Champlain's indication that people to the southward made raids on the Kennebec Indians by asserting that it was the Massachusetts who thus made war in Maine. At Cohasset and at Plymouth he had bloody skirmishes with the natives, but he seemed to have a knack for making peace which few of the English possessed. By ransoming back the canoes which he had seized during the Plymouth battle, he not only secured a resumption of friendship but some more beaver skins as well. This was the first time in New England's history that bloodhsed was followed by a negotiated settlement between the Indians and whites. In most other instances the explorers had run away. This victory of Smith's was largely nullified a few weeks later when his associate, Captain Thomas Hunt, arrived at Plymouth and coolly kidnapped twenty-four Plymouth natives and sold them into slavery in Spain. One of these Indians was Squanto,

who later became interpreter for the Pilgrims.

The years following John Smith's voyage were marked by an increasing number of English trading voyages to New England. Few of these produced narratives of any archaeological value, but the fragmentary reports available about them give us a fair picture of the course of Indian history. Later in 1614, Captain Hobson brought back Epenow, one of Edward Harlow's captives, to Martha's Vineyard, and by conspiracy with his fellows the wily Indian made good his escape amid a shower of arrows. Indian hostility here thwarted another attempt at settlement. In 1615 Richard Hawkins and Richard Vines wintered at Monhegan and Saco Bay, respectively, and severally reported a devastating Indian war among the Maine tribes, and the even more destructive ravages of the great plague. This disease, a horribly fatal pestilence among the Indians, swept away the major portion of the abundant population from Portland to Cape Cod, and made possible the settlement of Massachusetts. It was probably a European disease to which the English were immune, for Vines reported that although he and his associates "lay in the cabbins" with the suffering savages," not one of them ever felt their heads to ake while they stayed there." It was at its height in the winter of 1615-1616, and we may judge of its severity in Massachusetts by the fact that Squanto, arriving back at Plymouth in 1619, found all his people dead.

The last voyage of which we have a good chronicle was that of Thomas Dermer in 1619. While in Newfoundland in 1618 he ran across Squanto, who, after being rescued by Spanish friars, had made his way to London and there lived for a year or more in the household of John Slany, an officer in the Newfoundland Company. At length he had reached Newfoundland, and Dermer determined to use his services as a pilot andinterpreter in a voyage of discovery in New England.

Dermer passed from Monhegan southward along the coast, where he found some "antient Plantations, not long since populous now utterly void, in other places a remnant remaining but not free of sicknesse." He arrived at Plymouth, "finding all dead", and travelled a day's journey westward to "Nummastaquyt", from which he dispatched a messenger a day's journey further west, to "Poconaokit", which we know as Massassoit's village on the Taunton River. Here he rescued a captive Frenchman who had been shipwrecked in Massachusetts Bay, and he recorded that he later saved another at "Mastachuset". At a place called Sawahquatooke, which sounds like the Saco Bay area, Squanto was allowed to remain with his friends. Dermer now returned to Monhegan to arrange for sending his larger vessel to Virginia, and himself proceeded down the coast in a pinnace. Suffering near shipwreck somewhere about Cape Ann, and temporary capture by the Indians at Chatham, he at length arrived at Martha's Vineyard and there talked with Epenow, who as we know had spent three years in England. Dermer had fights with the Indians in Buzzard's Bay, but was aided by friendly natives in navigating Long Island Sound. At length he reached Virginia. The next year he again came to New England and received mortal wounds at the hands of Epenow at Martha's Vineyard.

I have taken the trouble to outline the course of events in these years before the landing of the Pilgrims simply to suggest the type of reception Englishmen were receiving at the hands of the Indians. The early voyages had been marked by friendliness and mutual curiosity between the races, but in almost every voyage from the time of Champlain onward there was bloodshed, or the threat of it. Massachusetts was a particularly dangerous area in which to trade, and had not disease conquered the hostile tribes on that coast it seems almost inconceivable that the Pilgrims could have survived their enmity. The justly famous peace of Massasoit was the expedient of a helpless remnant of the Wampanoags in defending themselves against neighboring tribes to the southward whom the plague had not attacked.

The narratives of the early explorers here so briefly outlined contain much material worthy of thoughtful interest to New England archaeologists. If any light is to be thrown on the Indian history of the plague-swept areas, it can only be through study of these chronicles. Those of us who have attempted to find colonial records of village sites in these coastal areas have almost invariably failed, but the explorers logbooks often fill the gap. In the limited area which I have studied on the South Shore of Massachusetts Bay, the correspondence of the explorers' descriptions with the locations of known village sites is so definite as to lead me to the belief that almost all of these villages were flourishing in the early 1600's. I am convinced that there is information scattered among these narratives which, intelligently applied to some local or tribal or cultural problem, may push aside the barriers to a more complete understanding of New England archaeology.

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A STONE PAVEMENT AT ANDOVER, MASSACHUSETTS

Arthur M. Hofmann

Site M/12/43, located in Andover, Essex County, Massachusetts, is an undisturbed prehistoric site at which the writer has been conducting excavations since May, 1939. Although it will require much more time to complete excavation of this site, and to prepare a final report, it seems wise to publish this paper at the present time. It is hoped that this preliminary report of a strange find may be of some archaeological value.

Late in August, 1940, a very curious stone pavement was uncovered. Although reports of some so-called stone pavements have been published, none of them, so far as the writer has been able to discover, are similar to the one that has come to light at Ballardvale, in the town of Andover. The only record of a stone structure resembling that at Ballardvale which has come to the writer's attention is in "An Algonkian Village Site near Levanna, New York," by William A. Ritchie, Research Records of the Rochester Municipal Museum, No.1, 1928. While the pavement at Levanna resembles in some respects the one that was found at Andover, the latter is symmetrical while the former is not.

The Ballardvale pavement is a very curious yet carefully built structure. The writer will leave to others a determination of the purpose for which it was constructed. That it was built by man, there is not the slightest doubt; that it was constructed by the prehistoric people who once occupied this site seems almost certain, yet we have no definite evidence that this is so. Its situation almost in the center of an Indian site that has never been disturbed, where stone implements, potsherds in abundance, deer bone, charcoal, and chips and flakes by the thousands are to be found in the ground all around it, would seem to be ample proof of its Indian authorship. Still stronger proof is indicated by the fact that there is not a single bit of evidence, absolutely none, of contact between the inhabitants of this site and the white man.

A very puzzling fact, established in uncovering this stone structure, was that nowhere within four feet of the outside edge of the pavement was any Indian evidence discovered. Not a single chip, flake, potsherd , or implement lay within the zone directly abutting the pavement itself. Everywhere just outside this zone, however, the ground yielded Indian evidence in great abundance. Who can state whether this was because the Indians considered the pavement sacred and would therefore allow nothing earthly to come near it, whether it was some sacramental rostrum where only the privileged might stand, or whether a lodge or dwelling had at some time been built over it? Was this structure used in connection with a sweat lodge? Who can answer these questions with reasonable assurance that his statements are in truth facts? Was the pavement constructed for commercial purposes, for the drying by air and sun of meat, fish, hides, or grain? These questions the writer cannot answer, nor has he been able to learn the answers from published sources.

The pavement was constructed at ground level, as ground level existed at the time the site was occupied. It was built upon a bed of white sand, with the bottom of the stones exactly at the level at which stone implements, charcoal, potsherds, and great quantities of chips and flakes are found. The highest part of the structure, the outside rim, is but one or two inches below the present ground level, making the total depth of the pavement about ten inches. The stones of which it is built consist entirely of sharp angular ones, placed very close together, there being very little or no earth between them. But a single round pebble shaped stone was used in the entire structure. The stones show very little evidence of the extensive use of fire, although they do have the appearance of being fire-cracked; very little evidence of ash or charcoal was found upon the pavement. Much evidence of extensive weathering is, however, apparent.

The entire work seems to have been constructed all at one time, although there are two distinct units, apparently purposely designed and built into the complete whole. Both units comprising the pavement are dish or saucer shaped, the larger unit having a depth of about five inches, the smaller, about three. The substance removed from the top surface of the structure consisted of a very fine black powder which had the appearance of being decayed vegetable matter which had accumulated there over a period of untold years. In this accumulation an oak tree had sprouted and grown, its roots working their way down the cracks between the stones. Beneath the stone work, pure white, undiscolored sand exists, there being no gradation from loam to sand. That the build-ers had a very definite idea in mind when constructing the platform is obvious. The entire work is extremely symmetrical, very carefully constructed, and could not have been built in a haphazard way, but must have been traced upon the ground before the actual building started.

The work of excavating was very carefully executed, great care being taken not to disturb a single stone. The entire pave-

ment was then carefully and thoroughly cleaned with a stiff brush, after which the remainder of the fine black material was blown away with a large bellows. Mr. Douglas S. Byers, of the Robert S. Peabody Foundation for Archaeology at Phillips Academy, Andover, visited the site with the writer on October 4, 1940, taking the accompanying photograph, and examining the site. These photographs, as well as the writer's collection of artifacts from this site are now in the Foundation's Museum, securely housed and awaiting future study.

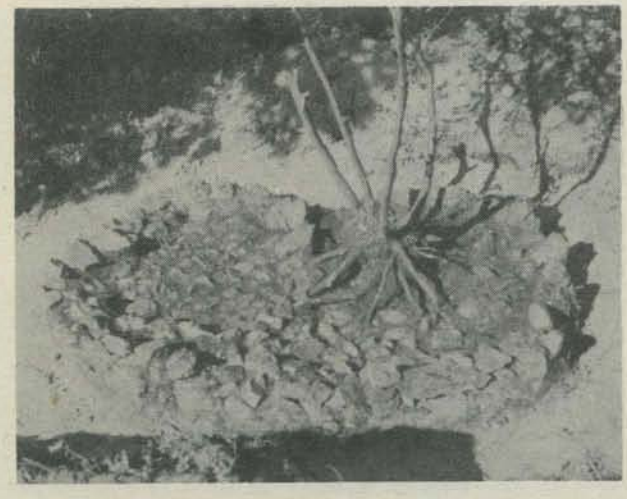

Fig.7

In shape, the pavement somewhat resembles a kidney, or the outline of a pumpkin. It measures 7 feet 10½ inches across, by 6 feet 2½ inches from the base to the place where the pumpkin's stem would be. The smaller unit of the pavement (in the upper left hand part of the photograph) is three to four inches higher than the larger, or main unit. Both sections are high on the rim, and are dish shaped.

The largest stones used in the construction of this strange affair are about twice the size of a man's head, while the smallest are approximately the size of a man's fist.

At the close of the 1940 field season the pavement was carefully covered with leaves and brush. Since then the entire structure has been covered over with earth, leaves and brush to preserve it for future study by any interested person.

In conclusion, the writer would welcome and be very thankful for any information or data sent him which would help to solve the use or purpose of the stone pavement described in the above article. Any correspondence regarding the above matter should be addressed to the writer at P.O. Box 201, Ballardvale, Massachusetts.

Ballardvale, Mass.
January, 1941.

Applications for membership in the Society have been received from the following:

L. Cabot Briggs

Dr. G.E. Leontine

Dr. Elso S. Barghoorn, Jr.

Mr. Ray C. Smith

Mrs. Ray C. Smith

Miss Linda Smith

Mrs. Margaret A. Towle